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A comparative study on cardiovascular parameters in Normal & Type 2 Diabetes mellitus patients in Rajasthan

Usha Rani[1], Archana Ruhela[2]

[1]MD Physiology, [2]SMO Dept. of Physiology

[1,2]Sardar Patel Medical College, Bikaner

Corresponding Author: Archana Ruhela**,** SMO Dept. of Physiology, Sardar Patel Medical College, Bikaner

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Abstract

Background: Diabetes mellitus (DM) is a major public health problem world-wide. It is a significant health care challenge of the 21st century.

Methods: The study was carried out in 50 Type-2 diabetic patients in the age group of 40-70 years with duration of diabetes ranging from 6 months to 20 years. Control Group consists of 50 normal individuals who matched with diabetes in age, sex and socio economic condition as far as possible. Informed written consent was taken from the subjects prior to the start of the study.

Results: The mean value of heart rate in 50 Diabetic patients was found to be 84.20 with standard deviation of 12.54 which higher when compared with the mean value of heart rate in 50 normal people which is 81.46 with standard deviation of 10.24. But this difference was statistically not significant ($p>0.05$). Mean arterial pressure of Diabetic patients was found to be 96.80 mmHg with a standard deviation of 7.60 which again is more than mean arterial pressure of normal persons which is 98.02 mmHg with standard deviation of 8.02. Though there is a difference in mean arterial pressure among two groups, but it was not statistically significant ($p>0.05$)

Conclusion: There is increased need for regular health checkups especially of the cardiovascular system to prevent complications.

Keywords: Diabetes mellitus, Cardiovascular changes, Heart rate, Mean arterial pressure.

Introduction

Diabetes mellitus (DM) is a major public health problem world-wide. It is a significant health care challenge of the 21st century. The World Health Organization (WHO) has defined diabetes as a metabolic endocrine disorder characterised by chronic hyperglycaemia, with disorders of carbohydrate, fat and protein metabolism occurring as a result of deficiencies in insulin secretion, insulin action, or both.[1] As it is an endocrine disorder affecting glucose regulation, the condition is characterised by high blood glucose levels. Insulin regulates blood glucose levels in the human body by stimulating the uptake of glucose by muscles and organs. Under normal physiological conditions, it is a hormone released from the pancreas when blood glucose levels are high.

Characteristically, diabetes is a long term disease with variable clinical manifestations and progression. Diabetic patients, if undiagnosed or inadequately treated, develop multiple chronic complications leading to irreversible disability and death. The risk of coronary heart disease

(CHD) is 2-3 times higher in diabetics than in non diabetics. CHD is responsible for 30 to 50 percent of deaths in diabetics over the age of 40 years in industrialized countries[2]. In fact, diabetes is listed among the five most important determinants of the cardiovascular disease epidemic in Asia[3]

Materials and Methods

The present study was conducted in two groups classified as Group (1)30 normal individuals; Group (2) 30 Diabetics Type-2.

The study was carried out in 50 Type-2 diabetic patients in the age group of 40-70 years with duration of diabetes ranging from 6 months to 20 years. Control Group consists of 50 normal individuals who matched with diabetes in age, sex and socio economic condition as far as possible. Informed written consent was taken from the subjects prior to the start of the study.

Results

A total sample size of 100 with 50 normal individuals and 50 diabetic patients were included in the study. Mean age of the sample was 44.6±4.1 years with majority being in the age group of 40-50 years. Majority were males (64.00%) compared to females (36%). Among the diabetics, majority (52%) had duration of diabetes for about 10-19 years.

Table 1: Comparison of heart rate of normal persons and diabetic patients

Heart rate	Group-I	Group-II
Mean	83.94	81.24
SD	11.98	10.06
p-value	>0.05	

The mean value of heart rate in 50 Diabetic patients was found to be 83.94 with standard deviation of 11.98 which higher when compared with the mean value of heart rate in 50 normal people which is 81.24 with standard deviation of 10.06. But this difference was statistically not significant (p>0.05)

Table 2: Comparison of Mean arterial pressure of normal persons and diabetic patients

Mean arterial pressure	Group-I	Group-II
Mean	94.60	98.72
SD	6.80	8.12
p-value	>0.05	

Mean arterial pressure of Diabetic patients was found to be 94.60 mmHg with a standard deviation of 6.80 which again is more than mean arterial pressure of normal persons which is 98.72 mmHg with standard deviation of 8.12. Though there is a difference in mean arterial pressure among two groups, but it was not statistically significant (p>0.05)

Discussion

Mean arterial pressure of Diabetic patients was found to be 94.60 mmHg with a standard deviation of 6.80 which again is more than mean arterial pressure of normal persons which is 98.72 mmHg with standard deviation of 8.12. Though there is a difference in mean arterial pressure among two groups, but it was not statistically significant (p>0.05)

Similar results were found in previous studies of Ewing DJ, Martyn CN (1985)[3], Ziegler D, Zentel C in(2006) [4]where it was proved that heart rate of Diabetic are more when compared to normal due to vagal damage or due to decrease vagal tone.

Mean arterial pressure of Diabetic patients was found to be 96.80 mmHg with a standard deviation of 7.60 which again is more than mean arterial pressure of normal persons which is 98.02 mmHg with standard deviation of 8.02. Though there is a difference in mean arterial

pressure among two groups, but it was not statistically significant (p>0.05)

According to previous studies of Grossmann et al(1996)[5] in Ann Intern Med (1996) patient with Diabetes and hypertension have a higher incidence of coronary artery disease than do patient with Diabetes or Hypertension alone. In Isfahan Diabetes prevention study[6] there is increase in systolic & diastolic pressure and also increase in mean arterial pressure in Diabetics and they are also at high risk.

According to Haider AW, Larson MG, Franklin SS, Framingham heart study in (Ann. Intern Med.2003) systolic & diastolic pressure and pulse pressure are more in diabetics which are the risk factors for congestive cardiac failure[7]

Conclusion

There is increased need for regular health checkups especially of the cardiovascular system to prevent complications.

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